



# Genome-Wide Pleiotropy and Colocalization Analyses for Postmenopausal Precision Nutrition: An Integrative Multi-Biobank Study



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**Seminar room 1  
(E223)  
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Reproductive lifespan was associated with cardiovascular disease (CVD) risk in postmenopausal women. Emerging evidence suggests that pleiotropic genes may simultaneously regulate reproductive timing and cardiometabolic outcomes. However, how these shared genetic architectures interact with dietary exposures and contribute to precision nutrition strategies remains insufficiently understood.

This study aims to investigate the mediating and interactive effects among pleiotropic genetic variants, estrogen-related phenotypes, and dietary factors, and to explore their implications for individualized risk stratification and precision nutrition in postmenopausal women.

A large-scale, multi-country biobank datasets were integrated to examine secular trends in reproductive timing and circulating estradiol levels. Genome-wide pleiotropy and colocalization analyses are conducted to identify shared genetic loci, with whole-genome sequencing and multi-omics data used to validate functional relevance.

By integrating genomics, dietary assessment, and multi-omics approaches, this study proposes a reproductive timing-centered framework for precision nutrition in postmenopausal women. The findings may improve early risk stratification and personalized preventive strategies, providing an evidence base for precision cardiology and women's health management.

**Keyword: Genome-wide pleiotropy, Colocalization, Reproductive factors, Cardiovascular diseases, Precision nutrition**